COMPUTERS & GEOSCIENCES

An International Journal

Editor-in-Chief
D. F. MERRIAM
The University of Kansas

List of Contents and Author Index
Volume 20, 1994

PERGAMON

COMPUTERS & GEOSCIENCES

An International Journal devoted to the rapid publication of computer programs in widely used languages and their applications

Editor-in-Chief

D. F. Merriam, Kansas Geological Survey, The University of Kansas, Lawrence, KS 66047-3726, USA.
e-mail: dan_merriam@msmail.kgs.ukans.edu *Fax:* 913 864 5317 *Tel.:* 913 864 3965

Managing Editor

D. K. Saile, Kansas Geological Survey, The University of Kansas, Lawrence, KS 66047-3726, USA

Associate Editors

F. P. Agterberg, Geological Survey of Canada, 601 Booth Street, Ottawa, Ontario, Canada K1A 0E8
G. F. Bonham-Carter, Geological Survey of Canada, 601 Booth Street, Ottawa, Ontario, Canada K1A 0E8
J. M. Cubitt, Geochem Group, Chester Street, Saltney, Chester CH4 8RD, UK
D. M. Hawkins, Department of Applied Statistics, University of Minnesota, St Paul, MN 55108, USA
R. J. Howarth, Department of Geological Sciences, University College London, Gower Street, London WC1E 6BT, UK
R. W. LeMaitre, "Lochiel", Ross 7209, Tasmania, Australia
D. C. Peters, U.S. Bureau of Mines, PO Box 25086, Building 20, Denver, CO 80225, USA

Book and Software Review Editor

E. Grunsky, Geological Survey Branch, Ministry of Energy, Mines & Petroleum Resources, 1810 Blanshard St, Victoria, BC, Canada V8V 1X4
e-mail: egrunsky@mp.gsb.empr.gov.bc.ca *Fax:* 604 952 0381 *Tel.:* 604 952 0424

Assistant Editors

J. C. Brower (USA)
R. G. Craig (USA)
M. L. Crawford (USA)
G. deMarsily (France)
J. Doveton (USA)
A. G. Fabbri (The Netherlands)
P. F. Fisher (UK)
A. Förster (Germany)
F. Gradstein (Norway)
J. K. Hall (Israel)
J. T. Hanley (USA)
J. W. Harbaugh (USA)
U. C. Herzfeld (USA)
D. G. Jewett (USA)
A. Khan (UK)
E. Kirova (USA)
R. W. Knapp (USA)
R. Pflug (Germany)
J. E. Robinson (USA)
W. Schwarzacher (UK)
B. R. Shaw (USA)
M. A. Sophocleous (USA)
P. G. Sutterlin (USA)
H. Teil (France)
J. C. Tipper (Germany)
D. Unwin (UK)
G. V. Wolf (USA)
R. T. Williams (USA)

Editorial Correspondents

L. Carbognin (Italy)
H. A. F. Chaves (Brasil)
I. Djafarov (Azerbaidzhan)
G. Gaal (Hungary)
D. Gill (Israel)
J. Harff (Germany)
Liu Chengzuo (China)
P. Macquire (UK)
N. Nishiwaki-Nakajima (Japan)
M. Pena Daza (Bolivia)
R. A. Reyment (Sweden)
W. Scherer (Venezuela)
J. H. Schuenemeyer (USA)
H. Wackernagel (France)
V. T. Vuchev (Bulgaria)
Zhao Pengda (China)
P. J. Yarka (USA)

Officers and Council of the IAMG (1992–1996)

President: M. E. Hohn (USA)
Past President: R. B. McCammon (USA)
Vice President: C.-J. F. Chung (Canada)
Secretary General: R. A. Olea (USA)
Treasurers: J. O. Kork (USA)
V. Nemec (CR)

Council Members

M. Alfaro (Chile)
D. Zhou (China)
E. Grunsky (Canada)
V. Pawlowsky (Spain)
J. C. Tipper (Germany)
G. Verly (UK)
P. D. Zhao (China)
Editor of *Journal of Mathematical Geology*: R. Ehrlich (USA)
Editor-in-Chief of *Computers & Geosciences*: D. F. Merriam (USA)
Editor of *Nonrenewable Resources*: R. B. McCammon (USA)
Editor of *Newsletter:* J. R. Carr (USA)

Publishing Office: Elsevier Science Ltd, Bampfylde Street, Exeter EX1 2AH, England [*Tel.* Exeter (01392) 51558; *Fax* (01392) 425370]. **Production Editor:** Karen Brocklehurst.

Subscription and Advertising Offices: *North America:* Elsevier Science Inc., 660 White Plains Road, Tarrytown, NY 10591-5153, USA; *Rest of the World:* Elsevier Science Ltd, The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, England [*Tel.* Oxford (01865) 843000; *Fax* (01865) 843010].

Subscription Rates: Annual Institutional Subscription Rates 1995: North, Central and South America, US$1006.00, Rest of the World £675.00. Associated Personal Subscription Rates are available on request for those whose institutions are library subscribers. Sterling prices exclude VAT. Non-VAT registered customers in the European Community will be charged the appropriate VAT in addition to the price listed. Prices include postage and insurance and are subject to change without notice.

Back Issues: Back issues of all previously published volumes, in both hard copy and in microform are available direct from Elsevier Science offices.

Published Monthly except in January and September. **Copyright © 1994 Elsevier Science Ltd**

Second class postage paid at RAHWAY, NJ. Postmaster send address corrections to *Computers & Geosciences*, c/o Elsevier Science Inc., 660 White Plains Road, Tarrytown, NY 10591-5153, USA.

Front cover—Three dimensional model of a carbonate reservoir in southwestern Kansas. Cells 2 × 250 × 250 ft based on sealevel datum showing where sonic log porosity exceeds 6%. Model constructed at Kansas Geological Survey using Stratamodel software run on a Silicon Graphics workstation.

List of Contents

NUMBER 1

Jean Louis Vigneresse	1	A set of programs to perform usual calculations on maps
J. P. Le Roux	17	Spreadsheet procedure for modified first-order embedded Markov analysis of cyclicity in sediments
Carl Richter and Dieter Krejci	23	The representation of directional geological data: TEC-hardware independent high-quality graphics
John O. Kork	31	JKPLOT version 2.00: a device-independent plotting system written in QuickBasic for an IBM PC
Souvick Saha, Lance Drager, and George B. Asquith	41	Simulating the Archie parameters: computer program and example from the Permian strata of West Texas
David M. Christie and Charles H. Langmuir	47	Automated *XY* plots from Microsoft Excel
Ronald C. Hinds, Neil L. Anderson, and Richard Kuzmiski	53	An integrated surface seismic/seismic profile case study of the Leduc Formation reef, Lanaway Field, Alberta, Canada
COGS Contribution Christina Hunt	75	Simulation model of ore transport at the Henderson mine
Short Note J. Garbrecht and L. Martz	85	Grid size dependency of parameters extracted from Digital Elevation Models
Review	89	

NUMBER 2

Marc P. Armstrong, Claire E. Pavlik, and Richard Marciano	91	Parallel processing of spatial statistics
Pierre-Yves F. Robin and David G. A. Ball	105	TEREQUIL: a program to calculate equilibrium composition pairs in ternary systems
Venkatesh Raghavan, Kiyoshi Wadatsumi, and Shinji Masumoto	121	SMILES: a FORTRAN-77 program for sequential machine interpreted lineament extraction using digital images
Jian-Cheng Lee and Jacques Angelier	161	Paleostress trajectory maps based on the results of local determinations: the "LISSAGE" program
Mihnea Corneliu Oncescu and Mihaela Rizescu	193	Conversion program package for seismological digital data formats on PCs
Max A. Meju	197	A general program for linear parameter estimation and uncertainty analysis
Andrew M. Parker	221	Binding FORTRAN layered earth modeling routines with Windows graphical user interface
Frederik P. Agterberg	229	FORTRAN program for the analysis of point patterns with correction for edge effects

T. S. Kutty and Sojen Joy — 247 — RFPHI—a program in TURBOC for the Rf/ϕ diagram method of two-dimensional strain analysis

NUMBER 3

C. M. Lemos — 265 — FDFLOW: a FORTRAN-77 solver for 2-D incompressible fluid flow

Dhruba J. Dutta — 293 — TRANS4: a FORTRAN program for computing apparent resistivity departure curves for an infinitely thick bed with transitional invaded zone in borehole geophysics

Patrice de Caritat, John Bloch, and Ian Hutcheon — 313 — LPNORM: a linear programming normative analysis code

J. A. García and J. Fdez-Valdivia — 349 — Boundary simplification in cartography preserving the characteristics of the shape features

John N. Dunlevey and Andrew A. Mitchell — 369 — MODEPLUS: a program for computer-assisted modal measurement

Wigor Webers — 395 — Fitting geophysical data series by independent oscillating constituents: algorithmic procedure and program PERIOP

Josef Ježek — 409 — Software for modeling the motion of rigid triaxial ellipsoidal particles in viscous flow

Short Notes

Sait İsmail Özkaya — 425 — Two AUTOLISP routines to aid manual construction of a balanced cross section using AUTOCAD

J. P. Le Roux — 433 — A spreadsheet template for determining sediment transport vectors from grain-size parameters

Call for Papers — I

NUMBER 4

Philip T. Giles, Michael A. Chapman, and Steven E. Franklin — 441 — Incorporation of a digital elevation model derived from stereoscopic satellite imagery in automated terrain analysis

José Fernández and John B. Rundle — 461 — FORTRAN program to compute displacement, potential, and gravity changes resulting from a magma intrusion in a multilayered Earth model

E. Pardo-Igúzquiza, M. Chica-Olmo, and F. J. Rodríguez-Tovar — 511 — CYSTRATI: a computer program for spectral analysis of stratigraphic successions

Larryn W. Diamond, Dirk Schmatz, and Felix Würsten — 585 — "STANDARD LIBRARY": a relational database for the management of electron microprobe standards

E. Pardo-Igúzquiza and M. Chica-Olmo — 597 — SPECSIM: a program for simulating random fields by an improved spectral approach

Dane R. Spearing — 615 — *ptchg*: a FORTRAN program for point-charge calculations of electric field gradients (EFGs)

Salil Agrawal — 625 — REFERENCE MANAGER: typing bibliographies made easy

S. Cao and I. Lerche 635 A quantitative model of dynamical sediment deposition and erosion in three dimensions

Reviews 665

Announcements I

NUMBER 5

GEOPHYSICS

W. T. C. Sowerbutts 669 Introduction

Xu Biwen and Ron D. Barker 671 Filter coefficients for Offset Wenner and Wenner resistivity sounding interpretation

B. Narasimha Rao and P. Rama Krishna 681 MAGPROS: an interactive FORTRAN-77 PC program for magnetic data processing

R. Nagendra, P. V. S. Prasad, and Venu G. K. M. Mallela 719 A 'C' program for inverting gravity profile data using the "Open–Reject–Fill" algorithm

Nong Wu 743 Pseudo-Chebyshev Spectral method for simulating one-dimensional magnetotelluric responses

Mark A. Herkommer and Paul D. Whitney 767 Minimizing misties in seismic data

F. Alejandro Nava and Ewa Glowacka 797 Automatic identification of seismic swarms and other spatio-temporal clustering from catalogs

I. V. Radhakrishna Murthy and S. Jagannadha Rao 821 Gravity inversion of horizontal circular discs and vertical circular cylinders

K. K. Mohanty and T. J. Majumdar 839 ALTIMETER_PLOT: a C-language program for simultaneous plotting of satellite altimeter-derived geophysical parameters

A. De Santis, G. De Franceschi, and D. J. Kerridge 849 Regional spherical modeling of 2-D functions: the case of the critical frequency of the F_2 ionospheric layer

C. Visweswara Rao, V. Chakravarthi, and M. L. Raju 873 Forward modeling: gravity anomalies of two-dimensional bodies of arbitrary shape with hyperbolic and parabolic density functions

Ralph W. Knapp and Neil L. Anderson 881 Digital hum filtering

Neil L. Anderson, John Hopkins, Alex Martinez, Ralph W. Knapp, P. Allan Macfarlane, W. Lynn Watney, and Ross Black 889 Dissolution of bedded rock salt: a seismic profile across the active eastern margin of the Hutchinson Salt Member, central Kansas

Announcement I

NUMBER 6

Fernando J. Caviglia 905 Computation of longshore currents and sediment transport

N. Kuka, A. Shtuka, and J. J. Royer 919 DESURV: an ANSI C program for borehole desurvey calculation by local least-squares fitting

X. Q. Ma and D. R. Watts 961 Terrain correction program for regional gravity surveys

E. Tipping 973 WHAM—a chemical equilibrium model and computer code for waters, sediments, and soils incorporating a discrete site/electrostatic model of ion-binding by humic substances

Shaoxiong Wen and Hanna Nekvasil 1025 SOLVCALC: an interactive graphics program package for calculating the ternary feldspar solvus and for two-feldspar geothermometry

COGS Contribution
Gary B. Sidder 1041 PETRO.CALC.PLOT, Microsoft Excel macros to aid petrologic interpretation

Review 1063

Announcements I

NUMBER 7/8

Amitabha Mukhopadhyay, Dipankar Saha, and Ajit Kumar Saha 1065 Development of a groundwater-management model using the dBASE facility

Houston C. Saunderson 1103 Multiquadric surfaces in C

Edmond Gomes and Anil K. Ambastha 1123 An analytical pressure-transient model for complex reservoir scenarios

Derek H. Smith and Michael Lewis 1137 Optimal predictors for compression of digital elevation models

Shaohua Zhou 1143 A program to model the initial shape and extent of borehole breakout

Thomas T. Tran 1161 Improving variogram reproduction on dense simulation grids

F. Delay, G. de Marsily, and E. Carlier 1169 One-dimensional solution of the transport equation in porous media in transient state by a new numerical method for the management of particle track

A. G. Tindle and P. C. Webb 1201 PROBE-AMPH—a spreadsheet program to classify microprobe-derived amphibole analyses

Kerry Gallagher and Malcolm Sambridge 1229 Genetic algorithms: a powerful tool for large-scale nonlinear optimization problems

Chris D. Clark and Colin Wilson 1237 Spatial analysis of lineaments

Short Note
F. F. Shaaban 1259 A new approach to analytical correction of Dual Laterologs

Letter to the Editor 1263

Comment 1265

Announcements I

NUMBER 9

V. Dimov, V. Iamakov, and K. Bozhilov	1267	Automated identification of monocrystal microphases in Transmission Electron Microscopy (TEM)
Philippe D'Arco and Anke S. Wendt	1275	Radial cracks around inclusions: a program to calculate P–T paths with respect to elastic properties of minerals
John Starkey and Abani Kanta Samantaray	1285	A microcomputer-based system for quantitative petrographic analysis
Sobhi Nasir	1297	PTOXY: software package for the calculation of pressure–temperature–oxygen fugacity using a selection of metamorphic geothermobarometers
Charles Ichoku, Jean Chorowicz, and Jean-Francois Parrot	1321	Computerized construction of geological cross sections from digital maps
Jiuqiang Jin	1329	BSAS: a BASIC program for two-dimensional subsidence analysis in sedimentary basins
Benoît Madé, Alain Clément, and Bertrand Fritz	1347	Modeling mineral/solution interactions: the thermodynamic and kinetic code KINDISP
James E. Mower	1365	Data-parallel procedures for drainage basin analysis
Philippe Renard and Gabriel Courrioux	1379	Three-dimensional geometric modeling of a faulted domain: the Soultz Horst example (Alsace, France)
Review	1391	
Announcements	I	

NUMBER 10

Ray Dearnley	1393	A BASIC program to calculate the temperature variation of mineral-growth rates
L. Hernández Encinas	1405	Partitioning large data sets: use of statistical methods applied to a set of Russian igneous-rock chemical analyses
J. M. Eiler, L. P. Baumgartner, and J. W. Valley	1415	Fast grain boundary: a FORTRAN-77 program for calculating the effects of retrograde interdiffusion of stable isotopes
Christophe Monnin	1435	Density calculation and concentration scale conversions for natural waters
P. V. Sathe and R. Vaithiyanathan	1447	Total reflectance of wind-roughened sea surfaces: directional properties
Jianping Xu and Richard G. Lathrop Jr.	1455	Improving cost-path tracing in a raster data format
W. J. Prakash, A. K. Varma, and S. M. Bhandari	1467	An algorithm for the precise location of the solar specular reflection point in the visible band images from geostationary meteorological satellites